

IN THE CLAIMS:

1. (canceled)

2. (currently amended) A method for determining whether avian eggs are qualified or unqualified for a premium quality based on shell characteristics, comprising the steps of:

providing a plurality of the eggs;

oscillating the shells of each egg by a non-contacting ultrasonic-wave source of ~~ultrasonic waves to obtain a single measurement from that needs only a single nominal operating frequency in order to propagate a spectrum of effects in~~ the oscillating shells that is detectable by a non-contacting detector, wherein said spectrum can be graphed according to the different speed -- or alternatively, because of the inverse relationship thereto, time-of-flight -- at which a select effect propagated from the source to the detector; and

determining whether each egg is qualified or not from spectrum analysis of the single measurement;

wherein the single measurement select effect comprises ~~information comprising at least~~ detected signal power as a variable against ~~that signal's~~ detected time-of-flight from source to detector and ~~further comprises an information portion that such that said spectrum can be graphed against a vertical axis for detected power versus a horizontal axis for the corresponding time-of-flight, wherein said spectrum as graphed so~~ is analyzed for a positive indication consisting of two sufficiently steady and strong peaks of detected power along the time-of-flight axis, and further that the two peaks are sufficiently steady over a sufficient amount of analysis time.

3. (currently amended) The method of claim 2 wherein the analysis comprises integrated response (IR) analysis of the ~~single measurement and the information spectrum or at least a portion thereof excludes power information for times of time-of-flight slower than a benchmark corresponding to the time-of-flight value obtained in the absence of any egg or other object between the source and detector, which slower times of time-of-flight presumptively correspond to reflected noise.~~

4. (original) The method of claim 2 wherein the positive indication is correlatable to a given quality determination of egg shell quality which in turn is associated with such a quality determination of the avian egg as relating to fertility or hatching or hatchling viability.

5. (currently amended) The method of claim 2 wherein the ~~information portion of the single measurement power spectrum~~ excludes power information for times of time-of-flight slower longer than a benchmark ~~that~~ corresponding to the time-of-flight value obtained in the absence of any egg or other object between the source and detector, which slower longer times of time-of-flight ~~presumptively~~ correspond to reflected noise.

6. (previously presented) The method of claim 2 wherein eggs qualified for premium quality are graduated to hatchery operations.

7. (canceled)

8. (canceled)

9. (currently amended) A method for sorting out sub-grade avian eggs from premium grade avian eggs comprising the steps of:

providing a plurality of the eggs;

positioning each egg in the path of a non-contacting, non-frequency sweeping source of ultrasonic waves and in relative proximity to a non-contacting detector of a signal obtained from the egg under the influence of the ultrasonic waves;

wherein said signal contains a spectrum of influences in the shells that are product of the source ultrasonic waves such that said spectrum can be graphed according to the different speed -- or alternatively, because of the inverse relationship thereto, time-of-flight -- at which a select influence propagated from the source to the detector; and

determining the eggs as premium grade or sub-grade based upon spectrum analysis of the detected signal;

~~wherein the detected signal select influence which is sought after for detection and analysis comprises detected signal strength such that said spectrum is transformable into a profile of detected signal strength versus time-of-flight from source to detector, which profile comprises an information portion that wherein said spectrum is analyzed for a positive indication of premium grade comprising two sufficiently steady and strong peaks of detected signal strength in the profile thereof, which peaks are furthermore analyzed for ability in contrast to inability to remain sufficiently steady all while during the analysis thereof.~~

10. (currently amended) The method of claim 9 wherein the analysis comprises integrated response (IR) analysis of the detected signal's strength versus time-of-flight values and ~~the information portion thereof excludes signal strength information for times of time-of-flight slower than a benchmark corresponding to the time-of-flight value obtained in the absence of any egg or other object between the source and detector, which slower times of time-of-flight presumptively correspond to reflected noise.~~

11. (original) The method of claim 9 wherein the positive indication of premium grade is correlatable to egg shell quality which in turn is associated with such a quality determination of the avian egg as relating to fertility or hatching or hatchling viability.

12. (currently amended) The method of claim 9 wherein the ~~information portion of the detected signal spectrum~~ excludes signal strength information for times of time-of-flight ~~longer~~ longer than ~~a benchmark that~~ corresponding to the time-of-flight value obtained in the absence of any egg or other object between the source and detector, which ~~slower~~ longer times of time-of-flight ~~presumptively correspond to reflected noise.~~

13. (previously presented) The method of claim 9 wherein eggs determined to be premium grade are graduated to hatchery operations.

14-15. (canceled)

16. (currently amended) Apparatus for determining premium grade avian eggs from sub-grade avian eggs comprising:

a source of ultrasonic waves from which is required only a single nominal operating frequency and an opposed ultrasonic detector in the path thereof spaced sufficiently to admit therebetween an egg without contact from either, wherein the egg produces a signal spectrum of signals detectable by the detector in response to blocking the path of the ultrasonic waves from the source;

wherein said spectrum can be plotted according to the different speed -- or alternatively, because of the inverse relationship thereto, time-of-flight -- at which a select signal propagated from the source to the detector; and

a processor for determining the eggs as premium grade or not based upon spectrum analysis of the detected signal;

wherein the processor includes services of an analyzer that transforms plots the detected signal spectrum into a profile comprising, as along one axis, detected strengths of the various select signals strength versus, as along another axis, time-of-flight from source to detector for each, which profile comprises an information portion that wherein said spectrum is analyzed for a positive indication of premium grade comprising two sufficiently steady and strong peaks of detected-signal strength in the profile thereof, which peaks are furthermore analyzed for ability in contrast to inability to remain sufficiently steady all while during the analysis thereof.

17. (currently amended) The apparatus of claim 16 wherein the analyzer undertakes integrated response (IR) analysis of the detected signal's strength versus time-of-flight values and the information portion thereof excludes signal strength information for times of time-of-flight slower than a benchmark corresponding to the time-of-flight value obtained in the absence of any egg or other object between the source and detector, which slower times of time-of-flight presumptively correspond to reflected noise.

18. (original) The apparatus of claim 16 wherein the positive indication of premium grade is correlatable to egg shell quality which in turn is associated with such a quality determination of the avian egg as relating to fertility or hatching or hatchling viability.

19. (currently amended) The apparatus of claim 16 wherein the ~~information portion of the detected signal~~ spectrum excludes signal strength information for times of time-of-flight slower longer than a ~~benchmark~~ that corresponding to the time-of-flight value obtained in the absence of any egg or other object between the source and detector, which slower longer times of time-of-flight ~~presumptively~~ correspond to ~~reflected~~ noise.

20. (previously presented) The apparatus of claim 16 wherein eggs determined to be of premium grade are graduated to hatchery operations.